UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,781	03/29/2004	Michael S. Banik	BSEN122032	9503

26389 7590 11/29/2006

CHRISTENSEN, O'CONNOR, JOHNSON, KINDNESS, PLLC
1420 FIFTH AVENUE
SUITE 2800
SEATTLE, WA 98101-2347

EXAMINER	
SMITH, PHILIP ROBERT	
ART UNIT	**PAPER NUMBER**
3739	

DATE MAILED: 11/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/811,781	BANIK ET AL.
	Examiner	Art Unit
	Philip R. Smith	3739

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 November 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12-17,32-37 and 56-69* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12-17,32-37 and 56-69* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/19/05; 7/3/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

[01] The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Drawings

[02] The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "cooling channel" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

[03] Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be

notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

[04] Claim 56-59 are objected to because of the following informalities: "channel" is recited where "cooling channel" is expected. Appropriate correction is required.

Claim Rejections - 35 U.S.C. 112, Paragraph Two

[05] The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

[06] Claims 56-59 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

[07] With regard to claims 56,58: It is not clear from the drawings or from the specification how a circuit board may be fitted in the channel of the heat exchanger. According to [0117] of the published specification, the "circuit board 550" is "designed to fit within the front face of the heat exchanger 480."

[08] With regard to claim 59: It is not clear what "channel" is referring to. Figure 6G shows a heat exchanger 480 and circuit board 550 which are "generally semi-circular." A heat exchanger and a circuit board are specified which appear to be "positioned around a perimeter of the recess." A "channel" is not specified as being "positioned around a perimeter of the recess."

Claim Rejections - 35 USC § 103

[09] The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

[10] Claims 12-17,32-36,56,58,61-63,65-67,69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ross (2002/0193664) in view of Moriyama (5,976,074) and in further view of Hecht (6,871,993).

[11] With regard to claims 12,32,61,65,67: Ross discloses a single use endoscope that is removably connectable to a reusable control unit to form a system for examining an internal body cavity of a patient, comprising:

[11a] a shaft having a proximal end, a distal end and a number of lumens therein;

[11b] an imaging assembly ("CCD chip," [0030]) at or adjacent the distal end of the shaft to produce images of the internal body cavity, the imaging assembly including:

- a cap through which illumination light passes ("LED chip 10," "mounted on a ceramic substrate 12," "encapsulated in a clear epoxy substance to provide a lens," [0035]) and an imaging port ("viewing port 26," [0037]); and
- a heat exchanger assembly ("cooling means," [0011]; [0038]) including

one or more light emitting diodes mounted thereon ("array 20," [0037]), a lens assembly ("clear epoxy substance," as noted above) and a solid state imaging device ("CCD chip," as noted above), wherein the heat exchanger assembly is insertable into the cap.

[11c] Ross does not disclose:

- an articulation joint at or adjacent the distal end;

[11d] Moriyama discloses an articulation joint ("curvature part 12," 5/35). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to provide such an articulated endoscope. A skilled artisan would be motivated to do so in order to make the endoscope "capable of being inserted into a bent or curved insertion path" (1/25).

[11e] Ross does not disclose:

- a cooling channel in thermal contact with the light emitting diodes.

[11f] Hecht discloses a "core 28 [which] may incorporate active heat dissipation systems, such as liquid cooling passages that can be connected to a cooling system" (2/39-57). At the time of the invention, it would have been obvious to a person of ordinary skill in the art that the LEDs which compose the LED array device disclosed by Ross include a active heat dissipation systems, as taught by Hecht. A skilled artisan would be motivated to do so in order to "remove heat generated by the LEDs 16 and the substrate 26 to allow for higher power operating levels," as taught by Hecht (2/39-57).

[12] With regard to claim 13: Ross discloses that the heat exchanger assembly includes two light emitting diodes ("array," as noted above) and the cap of the imaging assembly includes two illumination ports ("protective shield 18," [0049]) aligned with the two light emitting diodes.

[13] With regard to claims 15,16,34: Ross discloses that the illumination ports may include a window that is coated with a phosphor ([0012]). In reduction to practice, the phosphor must obviously be applied to either an inside or outside surface of the illumination port windows with an adhesive.

[14] With regard to claim 35,36: Ross discloses that the phosphor coating is mixed with an epoxy ("protective layer 18 of optically clear glue such as epoxy," [0036]). Epoxy is inherently curable with an ultraviolet light shown through the windows of the cap.

[15] With regard to claim 17: The "CCD chip" disclosed by Ross (as noted above) inherently requires a cable having at least two shielded leads for transmitting images signals from the solid state imaging device differentially.

[16] With regard to claims 14,33,62,63,66,69: The heat exchanger disclosed by Ross includes a cylindrical recess into which a cylindrical lens assembly is fitted in order to retain the lens assembly in the heat exchanger ("[a]s shown, the substrate 12 of the array 20 is also annular to allow the camera attachment 36 or eyepiece components etc to be positioned aligned with the optical train 34," [0043]).

[17] With regard to claim 56: The LED array disclosed by Ross is "fitted into" the heat

exchanger disclosed by Ross.

[18] With regard to claim 58: Ross discloses that the one or more light emitting diodes are mounted on a circuit board that is positioned within a channel and that a channel allows a cooling fluid to flow against the surface of the circuit board to remove heat from the one or more light emitting diodes (as noted above).

Additional Claim Rejections - 35 USC § 103

[19] Claims 57,60,64,68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ross in view of Hecht, and in further view of Hess (6,734,893).

[20] Ross in view of Hecht discloses an LED at the distal tip of an endoscope. Ross in view of Hecht does not disclose a thermistor that produces a signal proportional to the heat at the distal tip of the endoscope.

[21] Hess discloses in 6/1-9 that "The temperature of the LEDs (25) is registered with a temperature sensor (24), e.g., a thermistor, for safety reasons." At the time of the invention, it would have been obvious to a person of ordinary skill in the art that the heat exchanger disclosed by Ross in view of Hecht include a thermistor as taught by Hess. A skilled artisan would be motivated to do so "for safety reasons," e.g., to prevent injury to a patient.

Additional Claim Rejections - 35 USC § 103

[22] Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ross in view of Hecht.

[22a] Ross in view of Hecht does not disclose flushing port ("water tubes," 1/39)

molded into a front face cap that directs a flushing liquid over the cap in front of the lens assembly. Smith discloses such an assembly. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to provide an endoscope with a flushing port. A skilled artisan would be motivated to do so in order to remove "blood, tissue, or other debris" (1/25).

Additional Claim Rejections - 35 USC § 103

[23] Claim 59 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ross.

[24] With regard to claim 59: Ross discloses a channel, but does not disclose that the channel is semi-circular. In reduction to practice, this would be a matter of obvious design choice.

Conclusion

[25] The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chin (2005/0137459); Henzler (6,551,240); Hirata (6,796,939); and Shipp (6,449,006) disclose endoscopes which use heat sinks to reduce heat accumulation at the distal tip. Logan (6,692,251); Brukilacchio (6,856,436); Popovich (2005/0180136); Arik (2004/0190305); Zhan (2004/0170017); Licht (2005/0030754); Shie (6,480,389); and Patel (7,024,573) disclose apparatuses for cooling LEDs or other semiconductor devices.

[26] Any inquiry concerning this communication or earlier communications from the examiner should be directed to Philip R. Smith whose telephone number is (571)

272 6087 and whose email address is philip.smith@uspto.gov. The examiner can normally be reached between 9:00am and 5:00pm.

[27] If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Linda Dvorak can be reached on (571) 272 4764.

[28] Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LINDA C. M. DVORAK
SUPERVISORY PATENT EXAMINER
GROUP 3700